6. Ruderal society, most abundant in waste places, and often associated with cultivated plants: *Echinochloa crus-galli*, *Anthoxanthum odoratum*, *Phleum pratense*, *Agrostis alba*, *Notholcus lanatus*, *Arrhenatherum elatius*, *Avena fatua*, *A. sativa*, *Bromus carinatus*, *B. marginatus*, *B. tectorum*, *B. villosus*, *B. hordeaceus*, *B. secalinus*, *Dactylis glomerata*, *Poa annua*, *P. pratensis*, *P. trivialis*, *Festuca elatior*, *Lolium temulentum*, *L. multiflorum*, *L. perenne*, *Triticum vulgare*, *Hordeum murinum*. Most of the others are either casual and sporadic, or occur indiscriminately in more than one of the above associations.

Salem, Oregon.

NOTES ON COELOGYNE

By T. D. A. Cockerell

Coelogyne is a remarkable genus of palaeotropical orchids, with over a hundred species, distributed from India to the New Hebrides. The type species, *C. cristata* Lindley, comes from the base of the Himalayas, and has beautiful white flowers, the lip marked with orange. The most remarkable thing about the genus is, perhaps, that the lip in some of the species is marked with black. I have before me a number of fresh flowers of *C. pandurata* Lindley, from Borneo. The profuse marking of the pale greenish lip is dull black, with a very faint rusty tint. The small concavity at the extreme base is cinnamon-brown. The other petals, and the long sepals, are pale yellowish green. The column or gynostemium is suffused with apple green, especially at the tip. The bright orange pollinia rest on a broad crenulate or subfimbriate base. The lip is described by Nash* as 2-keeled, but Pfitzer and Kränzlin† treat it as 3-keeled in their key. There is actually a well-developed median keel, but it is smaller than the others. Costantin‡ gives a colored figure of *C. pandurata*, but unfortunately it is colored bright bluish-green, whereas the color should be like that of *Trias oblonga* on the same plate.

* Standard Cyclop. Horticulture.

† Das Pflanzenreich, 1907.

‡ Atlas des Orchidées Cultivées, pl. 25, f. 1.

On examining the black markings of *C. pandurata* under the microscope and in sections, I found that they were entirely superficial, situated on innumerable closely placed small papillae. By transmitted light they appear brown, and the cinnamon color of the basal depression is doubtless due to the same pigment in dilute form. The pigment gives none of the anthocyanin reactions, nor does it look like anthocyanin. It is soluble in strong alkaline solutions, and produces a cherry-colored liquid. This readily stains paper, but does not change color on drying. Acid almost entirely discharges the brown color. I am indebted to Dr. F. Ramaley for the suggestion that the reactions resemble those of turmeric, derived from *Curcuma* (Zingiberaceae). The pigment in turmeric is curcumin, $C_{14}H_{16}O_7$. It seems evident that *Coelogyne* possesses a closely related though doubtless distinct pigment. Even in species such as *C. speciosa* and *C. asperata*, in which the lip is marked with red or cinnamon, there is probably no anthocyanin at all. Pfitzer and Kränzlin remark that blue or blue-violet colors are lacking in the whole tribe Coelogyninæ, but the genus *Pleione*, to judge from the descriptions, must certainly possess anthocyanin.

In the case of *Coelogyne sparsa* Reichb. f., Ames* quotes a collector to the effect that the flowers are white with lavender spots. This would suggest anthocyanin, but it must be an error, as others found the markings to be light brown or purplish brown.

Boulder, Colorado

BOOK REVIEWS

Rock's Lobelioideae of Hawaii†

The flora of the Hawaiian Archipelago has long been known as one of the most peculiar in the world, not alone for its fantastic forms of relatives of well known plants, but for the large number of species that are endemic there. Its isolation is so

* Orchidaceæ, fasc 2, p. 70.

† Rock, J. F. A Monographic Study of the Hawaiian Species of the Tribe Lobelioideae, Family Campanulaceae. Pp. I–XVI + 1–394. 217 full-page plates. Publication of the Bernice Pauahi Bishop Museum. Honolulu. 20 February, 1919.